REMARKS

Claims 7, 9, 10, 18, 19, 22, 25 and 26 are amended, and claims 6-10, 18-19, 22-23 and 25-26 are pending in the application.

The rejections based on 35 U.S.C. §112 should be withdrawn.

Claims 6-10, 18-19, 22-23 and 25-26 stand rejected under 35 U.S.C. §112, first paragraph, as being based on a disclosure which is not enabling. Specifically, the Examiner contends that Applicant's specification indicates that one or more disclosed improvements are "critical or essential" to the practice of Applicant's invention. The Examiner concludes that such critical or essential improvements must be recited in Applicant's claims, and cites In re Mayhew, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976), to support such conclusion. The Examiner is mistaken. Applicant's specification, unlike the specification at issue in Mayhew, does not specifically limit Applicant's invention to Applicant's expressly disclosed embodiments. Accordingly, it is improper for the Examiner to require that Applicant's claims be limited to such expressly disclosed embodiments.

The specification at issue in Mayhew limited Mayhew's claims to specifically disclosed embodiments. Such limitation occurred through Mayhew's disclosure that the embodiment described in his specification was required to produce a recited affect. For instance, the Mayhew Court indicates that Mayhew's specification stated that a strip and bath "are raised in temperature above what is ordinarily considered optimum

coating temperatures. *This is practicable because of special cooling apparatus, specially located.*" (emphasis in original) 188 USPQ 358. Additionally, the Mayhew Court indicates that Mayhew's specification stated that if a high temperature galvanizing spelter were present in a zone, "iron dissolution and dross formation would make it *impossible to produce the smooth coat produced by the present invention.*" (emphasis in original) 188 USPQ 361. As evidenced by the above-quoted sections of Mayhew's specification, Mayhew unambiguously stated in his specification that the recited invention required (i.e., was impossible without) specific embodiments set forth by Mayhew.

In re Mayhew was contrasted by the Patent and Trademark Office Board of Patent Interferences in Beale v. Schuman, 212 USPQ 291-294, at page 293. In Beale, the Board explained that In re Mayhew was inapplicable to a case in which an Applicant had provided nothing in his disclosure which required claims to be confined solely to disclosed embodiments.

Applicant's disclosure, like the disclosure at issue in Beale, provides nothing to indicate that Applicant's claims are to be confined solely to disclosed embodiments. Accordingly, In re Mayhew is inapplicable to Applicant's claims.

Specifically, Applicant has not indicated that any disclosed improvements are necessary to the practice of Applicant's claimed invention. Rather, Applicant indicates exactly the opposite, that "[o]ne or more of the [disclosed] techniques, or other techniques, can be

utilized in the production of 64M, 16M or 4M memory chips in accordance with the invention, with the invention only being limited by the accompanying claims appropriately interpreted in accordance with the doctrine of equivalents." (Page 9, lines 3-7 of Applicant's specification, emphasis added.) Applicant further indicates that the specifically disclosed methods of achieving high device density are provided by way of example only and not by way of limitation. (See, for example, page 37, lines 21-24; and page 39 lines 5-8). Thus, unlike the disclosure at issue in Mayhew, Applicant's disclosure in no way limits Applicant's claims to disclosed embodiments of Applicant's claimed devices. For at least this reason, the Examiner's rejections of claims 6-10, 18-19, 22-23 and 25-26 under 35 U.S.C. §112, first paragraph, are improper. Applicant therefore requests that such §112 rejections be withdrawn in the Examiner's next action.

Claims 7, 9 and 10 are rejected under 35 U.S.C. §112, second paragraph as being indefinite. Specifically, the Examiner rejects Applicant's use of the term "composite" within the claims. The Examiner contends that such term is vague and indefinite. Without admission as to the propriety of the Examiner's rejection, Applicant has amended claims 7, 9 and 10 to remove the word "composite" from such claims. Applicant therefore requests that the rejection of claims 7, 9 and 10 under 35 U.S.C. §112, second paragraph, be withdrawn in the Examiner's next action.

Applicant's pending claims are allowable over the prior art.

Pending claims 6-10, 18-19, 22-23 and 25-26 stand rejected under 35 U.S.C. § 103 as being unpatentable over Applicant's admitted prior art in view of Denboer. Applicant disagrees.

Applicant's pending claims recite specific memory cell densities which, prior to Applicant's disclosure, had not been attained by the art. Nothing in either Applicant's "Background of the Invention", or Denboer suggest that Applicant's specifically recited memory cell densities were attained prior to Applicant's filing of the application.

The Examiner cites the fact that 16M DRAM chips existed in the prior art prior to Applicant's filing as being evidence of the obviousness of Applicant's invention. Applicant does not dispute the prior art existence of 16M DRAM chips. What Applicant discloses and claims, however, are 16M DRAM chips formed to higher densities than had previously been disclosed by the art.

The Examiner correctly notes that "[m]aximizing density of a single transistor and other memory cells is a continuing goal in semiconductor memory fabrication," but then mischaracterizes the quoted phrase to be evidence of the obviousness of Applicant's invention. The quoted phrase is, in fact, evidence of the non-obviousness of Applicant's invention. The quoted phrase shows that, in spite of a continuing goal of maximizing density of memory cells, no one prior to Applicant to the best of Applicant's knowledge, had taught a 16M DRAM chip at the

density disclosed and claimed by Applicant. The fact that such density was a goal of persons skilled in the art which had not been achieved prior to Applicant's disclosure, evidences a long-felt need by persons of skill in the art to accomplish Applicant's invention. Such showing of long-felt need is one of the considerations set forth in the touchstone case of Graham v. John Deere for evidencing non-obviousness. (*See*, Graham v. John Deere Co., 383 US 1 (1966).) Thus, the Examiner's very quoted phrase evidences the non-obviousness of Applicant's claimed invention, not the obviousness of such invention. For at least this reason, claims 6-10, 18-19, 22-23 and 25-26 are allowable over the prior art.

Referring to the individual pending claims, the claims are further allowable for specifically reciting features which are neither shown nor suggested by the cited art.

For instance, referring to claim 6, the claim specifically recites a semiconductor memory device comprising from 16,000,000 to 17,000,000 functional and operably addressable memory cells arranged in multiple memory arrays formed on a die, the individual functional and operably addressable memory cells occupying an area on the die within the memory arrays, the occupied area of all functional and addressable memory cells on the die having a total combined area which is no greater than 14 mm^2.

Nothing in the Examiner's cited prior art discloses or suggests such recited semiconductor memory device. Specifically, nowhere in

Applicant's "Background of the Invention" is there any disclosure or suggestion that it was known in the art to form from 16,000,000 to 17,000,000 functional and operably addressable memory cells on a die having a total combined area which is no greater than 14 mm^2, and nowhere in Denboer is there disclosure or suggestion of such recited feature. As neither of the Examiner's cited references discloses or suggests the recited feature of a total of from 16,000,000 to 17,000,000 functional operable addressable memory cells arranged in multiple memory arrays formed on a die having a total combined area which is no greater than 14 mm^2, it is inconceivable that the references could, in combination suggested such recited feature. For at least this reason, claim 6 is allowable over the cited references.

Referring to claims 7-10, these claims depend from claim 6 and are therefore allowable for the reasons discussed above regarding claim 6, as well as for their own recited features which are neither shown nor suggested by the prior art. For instance, claim 9 recites that the claim 6 recited total die area is not greater than about 11 mm^2. It is inconceivable that references which do not even suggest a die having a recited total combined area which is no greater that 14 mm^2 could possibly suggest a die having such recited total combined area not greater than 11 mm^2. For at least this additional reason, claim 9 is allowable over the cited references. Applicant therefore requests allowance of claim 9 in the Examiner's next action.

Referring to claims 18-19, 22-23 and 25-26, these claims recite memory arrays containing at least one area of 100 square microns of continuous die surface area having at least 128 functional and operably addressable memory cells. Neither Denboer, nor Applicant's "Background of the Invention" section, suggests or discloses such recited feature. As neither of the Examiner's cited references suggests the recited memory arrays containing at least one area of 100 square microns of continuous die surface area having at least 128 functional and operably addressable memory cells, it is inconceivable that references could, in combination, suggest such recited feature. For at least this reason, claims 18-19, 22-23 and 25-26 are allowable over the cited references.

Claims 19, 25 and 26 are further allowable in that the claims recite memory arrays containing at least one area of 100 square microns of continuous die surface area having at least 170 functional and operably addressable memory cells. As discussed above, the Examiner's cited references do not even suggest a recited 100 square microns of continuous die surface having at least 128 functional and operably addressable memory cells. Accordingly, is inconceivable that such references could suggest such the recited continuous die surface having at least 170 functional and operably addressable memory cells. For at least this additional reason, claims 19 and 25-26 are allowable over the Examiner's cited references.

For the above discussed reasons, claims 6-10, 18-19, 22-23 and 25-26 are not obvious over the prior art. Applicant therefore requests that

the rejections of claims 6-10, 18-19, 22-23 and 25-26 under 35 U.S.C. § 103 be withdrawn in the Examiner's next action.

Applicant requests allowance of the pending claims in the Examiner's next action.

For the above-discussed reasons, the Examiner's rejections of claims 6-10, 18-19, 22-23 and 25-26 should be withdrawn, and claims 6-10, 18-19, 22-23 and 25-26 allowed to issue. Applicant therefore requests formal allowance of claims 6-10, 18-19, 22-23 and 25-26 in the Examiner's next action.

Respectfully submitted,

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